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Managerial Beliefs and Firm Performance: Field Evidence from Professional Elite Soccer

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Abstract

Using detailed field data covering ten seasons of the Italian soccer premier league, we provide the first evidence on the key role played by managerial beliefs in firm performance in a high-powered incentives natural setting where managers receive frequent feedback. We show that managers' confidence and risk tolerance positively affect performance. Next, we document asymmetrically biased belief updating, in line with prior laboratory work on non-managers. By shedding light on overlooked features of manager-firm interplays and managers' information processing, our findings corroborate and help qualify the "managers matter" view advanced in recent fieldwork based on low-frequency data.

Keywords: Managerial Beliefs; Firm performance; Professional Soccer; Field data.

JEL Classification: D01; D22; D81; D91; L20; Z20.

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1. Introduction

Why do firms behave differently from one another? Why do substantial differences arise even when companies belong to the same industry and face similar market conditions? In the last years, a rapidly expanding body of research in the economics and finance literatures sought to address this relevant but still poorly understood research question (Graham et al., 2013). A plausible explanation is that *managers* can make a difference in corporate performance. Heterogeneity in managerial characteristics has been overlooked for a long time, with most empirical studies typically relying only on firm-, industry-, or market-level variables in accounting for firms' policies and outcomes (Bertrand and Schoar, 2003).

In contrast, in the last fifteen years, things have dramatically changed. As highlighted by Guenzel and Malmendier (2020), even though standard neoclassical economics assumes that all managerial decisions are driven by rational payoff maximization, the strand of literature on managerial biases and firm outcomes "has been a leading force in dismantling the argument that traditional economic mechanisms – selection, learning, and market discipline – would suffice to uphold the rational-manager paradigm" (see on this also Schoar and Zuo, 2017). By documenting large and systematic *person-specific differences* in management "styles" and showing that some of the managerial differences in corporate practices are linked to differences in firm behavior and performance, Bertrand and Schoar's (2003) pathbreaking paper paved the way for a new area of research. However, despite substantial progress in recent years (Bandiera et al., 2020), a rigorous identification of specific managerial characteristics that – plausibly coupled with cultural factors and organizational and environmental conditions – make a difference for firm performance is still a key open question in economics and finance (Goodall et al., 2011).

In this study, we provide the first evidence on the key role played by managerial beliefs in firm performance in a high-powered incentives dynamic setting (elite soccer players are among the highest paid professionals in the world) where managers receive high-frequency feedback.[1] Our key explanatory variable is managers' *self-confidence*. Following Bénabou and Tirole (2002), we believe that confidence is valuable as "it improves the individual's motivation to undertake projects and persevere in the pursuit of his goals, in spite of the setbacks and

[1] Guenzel and Malmendier (2020) noted that early behavioral fieldwork on corporate finance failed to examine psychological factors affecting managerial decisions, by exclusively focusing on *individual investors*.

temptations that periodically test his willpower" (p. 877). Specifically, in our empirical analysis, this variable aims at capturing managerial confidence *in a given system of play*.[2] In professional elite soccer, tactical decisions over how to tackle official matches are arguably the major ones and managers' "typical playing style" can be viewed as his core competencies, i.e. the ones related to the domain (tactics) that strongly qualifies his professional identity and over which he is *fully accountable* and *expected to make a difference* at the helm of the team.[3] Therefore, even though we are aware that our definition of managerial confidence is domain-specific, rather than domain-general, we view it as closely related to soccer managers' most ego-relevant core competencies. A further advantage of this definition is that it provides us with a choice-based measure of beliefs (see Malmendier and Tate, 2005b, for a "revealed beliefs" approach to the measurement of CEO overconfidence; for a methodological discussion on stated vs. revealed beliefs, see Bruhin et al., 2018).

In our empirical analysis, we use detailed round-robin tournament data from four sources on 34 teams and 1,580 matches covering ten seasons of the Italian male soccer premier league ("Serie A"). As we know, in general, using sports data has both strengths and weaknesses. It is fair to say that a well-known caveat is the difficulty of extending sports findings to other industries. However, compared to prior work on managerial traits and corporate decisions, we also believe there are important though largely overlooked advantages in using data from professional elite soccer. A relevant limitation of most data used so far within the strand of empirical literature investigating the links between managerial characteristics and firm performance is the *low frequency of measurable corporate decisions* (e.g., acquisitions and investments) and *outcomes* (e.g. annual balance sheets), so that managers in many industries have limited learning opportunities (Guenzel and Malmendier, 2020). In contrast, the richness of our dataset allows us to sidestep these concerns, as it provides us with a "natural laboratory" characterized by high-frequency comparable managerial decisions over which managers

[2] See Section 2.2 for our operational definition of confidence. Importantly, as we explain in Section 2.3, unlike most of prior work (where the two dimensions are either conflated or intertwined), we also *separately* assess managers' *risk taking*, distinguishing between managers adopting offensive and defensive playing styles.

[3] This is well-known to soccer fans: top managers are usually associated to their playing philosophy, implying that many other characteristics of their leadership (e.g., training methods and players' nutrition plans, that are largely delegated to high-quality staff members) are viewed as clearly secondary with respect to tactical decisions.

receive high-frequency and unambiguously objective feedback (in each match, only three outcomes are possible: win, loss, or draw). Therefore, compared to other field and laboratory settings, we are able to provide a cleaner and more granular depiction of the dynamic relationships between managerial beliefs and the performance of the firm they are at the helm of in a setting in which learning opportunities are far from negligible.[4] Due to the limitations faced by prior empirical literature, real managers' belief updating in the face of new information is, to our knowledge, a largely unexplored yet extremely relevant phenomenon.[5]

Next, by using round-robin tournament data from elite soccer we focus on this link in a highly incentivized tournament setting in which a relatively large number of experienced managers are at the helm of same-industry firms and compete with each other under the same set of strictly enforced rules and have the same time horizon (dictated by the length of the tournament). A further contribution of our analysis is that we also distinguish between "top teams" and "weak teams" (see on this also Bucciol et al., 2019), so that we shed light on the connections between managerial characteristics and match outcomes separately for two types of firms that compete within the same industry but differ in terms of corporate key features and pursued goals.

Our paper speaks to three different strands of literature. One is the recent but fast-growing economics and finance literature investigating the role played by managerial traits and other characteristics in affecting corporate performance. So far, the identified characteristics span a series of top managers' personal traits, including behavioral biases that impact their decision-making processes, and relevant experiences they went through in their lives (Guenzel and

[4] As noted by Kahn (2000), professional sports statistics are often more detailed and accurate than other microdata sources. Other examples of studies using sports data to address more general research questions are Card and Dahl (2011); Pope and Schweitzer (2011); Massey and Thaler (2013); Bartling et al. (2015); and Depetris-Chauvin et al. (2020). A further advantage of using team sports data from professional soccer is that in our view, in this high-powered incentives setting, classic free riding concerns are substantially mitigated, compared to teamwork in other industries: in elite soccer, individual effort is publicly observable and players are well aware that their future earnings from new contracts depend far more on their individual performances than on team outcomes and, therefore, have a strong incentive not to free ride on others' efforts.

[5] Bandiera et al. (2020) interestingly rely on novel high-frequency, high-dimensional survey data on CEO behavior (unlike many prior studies based on small samples), but do not use high-frequency firm performance data. Huffman et al.'s (2019) innovative analysis relies on a high-powered tournament incentive system with detailed feedback, but with specific regard to managers working for a chain of food and beverage stores.

Malmendier, 2020).[6] We also relate to the vast body of experimental work in social psychology and economics examining individual belief updating in the face of good and bad information (Bruhin et al., 2018), with special regard to identity- or ego-relevant performance feedback. Prior laboratory studies have focused on the effects of noisy and non-noisy signals on processing of objective information, by paying attention to relevant dimensions such as asymmetry and conservatism (Eil and Rao, 2011; Mobius et al., 2014; Coutts, 2019).[7] Finally, we contribute to the economics literature seeking to identify the major determinants of success in professional team sports (Kahn, 1993; Frick and Simmons, 2008; Goodall et al., 2011), with special regard to the line of inquiry examining the role of managers on team performances in elite soccer tournaments (Bartling et al., 2015; Muehlheusser et al., 2018).

We report a series of intriguing findings. First, managers' confidence plays a key role in positively affecting firm performance. We also show that risk tolerance is positively and significantly associated with performance. Next, we provide clear evidence of *asymmetry* in managerial belief updating, in line with the "good news-bad news" effect documented by prior laboratory studies on non-managers in which subjects received signals with intrinsic valence. However, the documented positive effects of confidence on performance interestingly indicate that managerial biased updating process turns out to be ultimately *beneficial* in terms of performance. Finally, by separately examining top and weak teams, our analysis reveals that confidence and risk taking positively affect performance in top teams, but not in weak teams.

The remainder of the paper proceeds as follows. Section 2 describes our data and methodology. Section 3 illustrates our core results and Section 4 concludes and proposes avenues for future research.

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[6] Prior work in the area has examined the relationships between corporate behavior and managers' risk aversion (Lewellen, 2006; Graham et al., 2013), gender (Faccio et al., 2016), educational and professional background (Bertrand and Schoar, 2003; Malmendier and Tate, 2005a), general ability and execution skills (Kaplan et al., 2012), age (Yim, 2013), birth cohort (Bertrand and Schoar, 2003) and, importantly, overconfidence (Malmendier and Tate, 2005a; Malmendier et al., 2011), life experiences (Malmendier and Tate, 2005a; Malmendier et al., 2011; Schoar and Zuo, 2017) and "leader" behavior (Bandiera et al., 2020).

[7] As pointed out by Eil and Rao (2011), fieldwork providing supportive evidence on valence dependent, asymmetric processing of information includes applications in medicine as well as finance studies on post-earnings announcement drift in asset prices and housing price bubbles (see on this also Lefebvre et al., 2017, and Ma et al., 2020). Importantly, unlike most of prior work on belief updating based on repeated feedback, we rely on a choice-based measure of beliefs ("revealed beliefs") that aim to capture managers' tactical beliefs.

2. Data

2.1. Dataset

Our dataset comprises ten seasons from 2009/10 to 2018/19 of the Italian first division of male soccer ("Serie A"). Each season 20 teams compete by facing each other twice (double round-robin tournament), once at their home stadium and once at their opponent's one. Overall, each team plays 38 matches during a season, usually between the middle of August and the beginning of May. Teams earn three points per match in case of win, one point in case of draw and zero points in case of defeat. At the end of the season, the team with the highest number of points wins the league. The three teams with the lower number of points are relegated to the second division ("Serie B") and replaced in the following season by the three best teams of the second division. This way, the pool of teams changes in each season. Overall, we have data on 34 different teams during our study period; out of them, only 10 teams remained in the first division for all the ten years we considered.

Our dataset has been collected from four distinct sources: i) the official "Serie A" website (www.legaseriea.it) for match-specific information (outcomes, starting team, etc.); ii) the website www.tuttocalciatori.net for both managers' and players' individual characteristics; iii) the sports newspaper "La Gazzetta dello Sport" (www.gazzetta.it) for players' wages, and iv) the website https://www.football-data.co.uk/data.php for data on betting odds.[8]

The dataset covers a total of 1,580 matches played during the first half of the season, from September to December. This period was chosen to avoid to consider the usually non-negligible squad changes that normally take place during the winter transfer market.[9] Another reason for focusing only on the first half of the season is that managers' decisions and outcomes in the last matches are likely to be strongly *path-dependent*, in the sense that they risk being affected to a large extent by the team's contingent rank in the league: teams that have already achieved their objectives and those that can no longer reach them have lower incentives to do their best (to some extent, they might "rest on their laurels"), which might introduce serious biases in the analysis. For the purpose of examining the role of manager's confidence on team outcomes,

[8] Among the several betting odds data available online, we chose the source with the largest sample size (from the betting house Bet365).

[9] In August and January, teams can trade players. Those who have few opportunities to play usually move to other teams and teams with poor results normally invest money on better players. To address potential endogeneity issues, we restrict our analysis to the part of the season with a stable squad composition.

our unit of analysis is the performance of team *i* in match *t* at season *s*. Accordingly, we have a total of 3,160 observations (two teams per match).

The dataset provides information on the outcome of each match (win, draw or defeat), which acts as our dependent variable. Based on the points awarded, we define an ordered indicator of performance for team *i* in match *t* as follows:

$$performance_{it} = \begin{cases} 0 & \text{if team } i \text{ loses match } t \\ 1 & \text{if team } i \text{ draws match } t \\ 2 & \text{if team } i \text{ wins match } t \end{cases}$$

We also have information on the manager and the composition of the team (i.e. the eleven players that started the match). The latter information allows us to define the initial formation of each team in each match in the form of the number of defenders, midfielders and strikers, apart from the goalkeeper.[10] Table 1 presents a cross tabulation of the different combinations of defenders and strikers in our data. As can be seen, four defenders and two strikers (i.e. the well-known 4-4-2 setting) is by far the most frequent choice (33.70%), followed by four defenders and three strikers (i.e. 4-3-3 setting, 14.72%).

TABLE 1 ABOUT HERE

2.2. Managerial traits

Based on the choice of the initial setting, in this subsection we describe what we view as the potentially relevant managerial traits that we consider. Our key variable is "confidence". According to the theoretical framework developed by Compte and Postlewaite (2004), the probability that an individual will succeed in a task is not independent of psychological factors such as beliefs about performance. As we clarified in the introduction, in elite soccer it is plausible that team performance also depends on managers' confidence in their own core decisions (i.e., tactical ones). Therefore, confidence is defined here in terms of a manager's *perseverance in employing the same playing structure*. We opted for a choice-based measure

[10] The choice of the team formation requires the supply of all qualities of the players to match the functional requirements to take advantage of the opponent's weaknesses to win the match (Boom and Sierksma, 2003). It usually involves a particular way of playing because players' position on the pitch affects both offensive and defensive balance.

of managers' confidence in their tactical knowledge by defining it as a dummy variable equal to 1 when the match starts with the same initial setting as the previous one (*confidence*).[11] In our data, 53.2% of the matches start with the same setting as the previous match.

Match outcomes might also be affected by managers' risk-taking decisions. Recent fieldwork indicates that managers are more risk tolerant than the lay population and that managerial risk aversion is related to financial corporate policies (Graham et al., 2013). Because we expect soccer managers to display substantial heterogeneity also on this important dimension, we include risk taking in the analysis, by assessing it *separately* from confidence but, at the same time, like for the confidence variable, by defining it with regard to managers' core competencies (characteristics of the system of play). Specifically, we define two dummy variables for whether the manager's initial setting is offensive (*Risk tolerance*) or defensive (*Risk aversion*) depending on the number of strikers and defenders employed, respectively.[12] Overall, we have 34.1% risk tolerant settings and 32.1% risk averse settings.

2.3. Control variables

As control variables, we derive a set of match-, manager- and team- specific characteristics. For the match, we have information on whether the match is played at home (*Home*) and the ex-ante favoritism of each team in terms of their expected pre-match winning probability (*Win probability*). There is large evidence that playing at home conveys great advantage (Dohmen and Sauermann, 2016), both because of referee bias (Sutter and Kocher, 2004) and fans' pressure over the opposite team (Reilly and Witt, 2013). Accordingly, teams playing at their home stadium are expected to perform better.

The pre-match teams' winning probabilities (*Win probability*) are obtained as the inverse of the betting odds. Assuming that betting markets are efficient (Croxson and Reade, 2014), the inclusion of team's pre-match winning probability in the analysis allows us to implicitly control

[11] An alternative option would have been to define confidence in terms of choosing *the same starting eleven*. We disregarded this option because injuries and sanctions frequently force the manager to change the starting team and, therefore, *not* to decide based on his *core beliefs*. Our data clearly indicate that managers seldom employ the same starting eleven as in the previous match (it happens in just 8% of our observations).

[12] We consider a team setting to be offensive when it includes either three or more strikers or less than four defenders. Conversely, we consider a team setting to be defensive when it includes either more than four defenders or less than two strikers. In this way, the popular 4-4-2 team setting represents the baseline case of risk neutrality.

for relevant factors that potentially affect the outcome of the match such as players' *injuries* or *sanctions* or the *quality of the opposite team*.[13] Importantly, in order to view a manager's attitude to employ the same system of play (i.e., confidence) as reflecting a personal prior belief, rather than a decision confounded by contingent external factors, it is crucial to make sure that this tendency holds once *all valuable information* available ex ante is taken into account. If, say, before a new match begins, a manager were forced to change his tactical philosophy due to injuries or sanctions that make some players unavailable, it would be conceptually questionable to attribute changes in the initial setting to lack of confidence. The same holds for situations in which a manager seeks to adapt his team to a new match keeping account of the quality of the opposite team.

In this regard, the expected pre-match winning probability variable allows us to keep account of important information on ex-ante favoritism of each team. Relatedly, the reason why we define both "confidence" and "risk taking" in terms of managers' decisions over *initial* lineups only is that during the matches their choices are likely due to strategic adjustments to contingent, unexpected events such as players' injuries and received yellow or red cards as well as their team being behind the expected match outcomes (Bartling et al., 2015).

Next, it is worth noting that the winning probability variable plays another key role in our analysis of the links between managerial decision-making and firm performance in our setting. As pointed out by Bartling et al. (2015), the winning probability sets a salient reference point about the *expected* outcome of a match. Suppose a very talented team faces a recently promoted weak team. Based on the quality and characteristics of both teams, let us assume the market expects the top team to have a 90% winning probability. If the favorite team wins the match, this falls under expectations. However, if the weak team (the so called "underdog") beats the top one, then this unexpected result may turn out to produce significant effects on both teams. In the favorite team that loses, this outcome may trigger a higher pressure to win the following match. This higher pressure potentially arises from different sources, including the self-recognition of bad performance and the need to compensate it with a win, external media and fan's pressure, or fears about the negative consequences of an additional defeat (Dohmen,

[13] Although there is some evidence of optimistic bias in sports betting (Forrest and Simmons, 2008), the study by Page (2009) shows that this individual fan bettors bias does not affect betting odds because it is compensated by the decisions of expert bettors. Card and Dahl (2011) and Bartling et al. (2015) use betting market data to infer expected match outcomes.

2008b). This also directly relates to the literature on *choking under pressure* (Bucciol and Castagnetti, 2020), according to which players might underperform due to fear of not performing as desired or failing, especially in decisive moments of the game like penalty shoot-outs (Apesteguía and Palacios-Huerta, 2010). By contrast, if the underdog wins, there could be a boost in self-esteem and trust in the manager and his ideas, which in turn might positively affect subsequent performance. Nevertheless, if the unexpected win were just due to chance, it could generate overconfident beliefs and possibly produce a negative effect on the following match. Therefore, in order to control for these further potentially important factors, we consider *Unexpected win* and *Unexpected defeat* as two dummy variables that take value one if the team won (lost) the previous match although being the underdog (favorite), respectively.

Apart from the expected versus unexpected nature of the past match outcome, heavy wins (defeats) could also impact team's morale, cohesiveness and trust in mates and the manager. There is some evidence indicating that past successes enhance subsequent performance (Rosenqvist and Nordström-Skans, 2015). To explore this, we also consider the goal difference in the previous match (*Lag goal diff.*).

For the manager, we consider his age (*Age*), experience in the competition (measured as the number of years training in "Serie A", denoted by *Years in A*), nationality (whether he is foreign or not, *Foreign*) and whether the current season is the first training the team (*New in team*). Additionally, since a manager may be dismissed and replaced by a colleague during the season, we define a dummy variable for whether the manager is different from the one who started the season (*Dismissed*). For the team characteristics, based on the starting eleven, we obtain average age (*Avg. age*), the share of foreign players (*Share foreign*), the share of new players in the team (*Share new*), average experience in terms of years playing in the "Serie A" (*Avg. years in A*), average wages (in logs, denoted by *Log wage*) and whether the team has just been promoted from the second division (*New in A*). All these team indicators vary per match based on the composition of the starting eleven, except the latter that is constant throughout the season. Table 2 provides summary statistics of these variables.

A team wins (and loses), on average, 37% of the matches played, earning 1.36 points per match. The remaining 26% of the matches end with a draw, making the goal difference per match to be zero on average. The average winning probability is 39%, ranging from 3% to 94%. Around 9% of the matches end with an unexpected win (defeat).

Regarding manager's characteristics, the average age is around 50. About 45% of the managers train the team for the first time, being 13% of them foreigners. Average experience in the competition is 4.5 years, with 11% of managers being fired during the study period. As for team characteristics, the starting eleven is on average 27.3 years old and has 4.5 years of experience in the Serie A. Lineups are composed of about 50% of foreign players, with 36% of the footballers playing in the team for the first season.

TABLE 2 ABOUT HERE

2.4. Preliminary evidence

Our first goal is to check whether manager's confidence and risk taking have some relationship with the outcome of the match. As a preliminary check, in Panel a) of Table 3 we compare the average proportion of confidence, risk tolerance and risk aversion between: i) match winners and non-winners (i.e. drawers or losers), and ii) match losers and non-losers (i.e. drawers or winners). We group drawers with either option for sake of simplicity. We also report the value of a *t*-test on the statistical equality of the average for the two groups. Interestingly, we find no evidence of a difference in confidence and risk taking between winners and non-winners, while we detect a significantly higher level of risk aversion (risk tolerance) among losers (non-losers). That is, risk aversion seems to be more prevalent, on average, in lost matches. Another way to see this is that risk tolerance is associated with not losing the match and earning at least one point.

We then repeat the same exercise in two separate sub-samples of data, to check whether the results change depending on the quality of the team. In particular, we distinguish between "top teams" and "weak teams", which we define according to their wage level (on this distinction, see also Bucciol et al., 2019). Assuming that wages are a good proxy for players' skill, we identify as top (weak) teams those with average wage in the season above (below) the season-specific median wage. Therefore, "top teams" are those usually fighting for the championship or a high ranking in the league (which grants access to a European competition in the following year), while "weak teams" are those usually competing in the pursuit of less ambitious goals, such as avoiding relegation to the second division.

Panels b) and c) of Table 3 report our preliminary analysis of Panel a) separately for top and weak teams. The higher level of risk aversion among losers is only preserved among top teams.

Weak teams, in contrast, display a significant difference between losers and non-losers in terms of confidence. Interestingly, we also observe that in top teams managers are both more risk tolerant and less risk averse than in weak teams.[14] This finding has some analogies with Bartling et al. (2015), who, however, analyze managerial decisions *during matches* and observe different decisions for favorites vs. underdogs: they document that, though patterns of strategy adjustments are similar, managers of underdogs make smaller offensive strategy adjustments when behind by one goal and slightly more defensive substitutions when they are one goal ahead.

However, it is fair to say that at this stage our analysis may be biased, because it does not control for the characteristics of the manager and the match. For this reason, in what follows we rely on regression analyses.

TABLE 3 ABOUT HERE

3. Analysis

3.1. Methodology

We model team performance as a function of confidence, risk taking, a set of match-, manager- and team-specific characteristics, and team-season individual effects as follows:

$$Perf_{it}{}^{*} = \beta Conf_{it} + \gamma RT_{it} + \delta X_{it} + \theta Manager_{it} + \varphi Team_{it} + \mu_i + \varepsilon_{it} \qquad (1)$$

where $Perf_{it}$ stands for performance, $Conf_{it}$ is confidence, RT_{it} describes manager's risk tolerance and risk aversion, X_{it} is a set of match-specific characteristics that include *Home*, *Win probability*, *Lag goal diff.*, *Unexpected win* and *Unexpected defeat*; $Manager_{it}$ is a set of manager's characteristics including *Age*, *Years in A*, *Foreign*, *New in team* and *Dismissed*; $Team_{it}$ are match-varying team composition characteristics that include *Avg. age*, *Share*

[14] In general in top teams, managers are more risk tolerant (37.3% vs. 30.8%; proportion test: -3.86; p-value<0.001) and less risk averse (28.9% vs. 35.2%; proportion test: 3.79; p-value<0.001), more experienced (5.07 vs. 4.01 years in the first division; t-test: -7.42; p-value <0.001), more likely to be foreigners (20.7% vs. 5.53%; proportion test: -12.65; p-value <0.001), less likely to be new in the team (43.25% vs. 47.17%; proportion test: 2.21; p-value 0.027) and less likely to enter the team during a season after dismissal of a previous manager (7% vs. 15.35%; proportion test: 7.43; p-value <0.001).

foreign, *Share new*, *Avg. years in A*, *New in A* and *Log wage*; $\beta, \gamma, \delta, \theta$ and φ are vectors of parameters to be estimated; ε_{it} is a normally distributed random error term with variance σ_ε capturing idiosyncratic effects affecting performance, and μ_i is a team-season specific random error term that follows a normal distribution with variance equal to σ_μ. Considering the longitudinal structure of the data and the ordered nature of the dependent variable, the model in Equation (1) is a panel ordered probit with random effects at the team-season level.[15] Unobserved team effects are treated as random because the inclusion of "fixed" effects in the form of dummy variables in nonlinear panel models would produce an incidental parameter bias (e.g., Greene, 2004).

The model in Equation (1) treats confidence as an exogenous variable. However, the use of the same setting is a decision that might be affected by both observable (manager- and match-specific characteristics) and unobservable factors. To address this potential endogeneity, we model performance together with confidence as follows:

$$\begin{cases} Perf_{it}^{*} = \beta Conf_{it}^{*} + \gamma_1 RT_{it} + \delta_1 X_{it} + \theta_1 Manager_{it} + \varphi Team_{it} + \mu_i + \varepsilon_{it} \\ Conf_{it}^{*} = \delta_2 X_{it} + \theta_2 Manager_{it} + \delta Z_{it} + \omega_i + \eta_{it} \end{cases} \quad (2)$$

where ω_i are team-season random effects influencing the confidence decision with variance σ_ω; η_{it} is the error term for the binary endogenous equation with variance σ_η; and Z_{it} is a set of instrumental variables varying across teams and matches that act as exclusion restrictions. These variables provide an additional source of variability to the endogenous equation for identification. We consider the following two instrumental variables: i) the difference in the winning probabilities between the previous and the current match (in absolute value, denoted by *Diff win prob.*), and ii) the shots on target in previous match (*Shots on target*). The former controls for team setting changes derived from facing a really top (weak) team that requires some sort of adaptation that preludes confidence. The latter is an indicator of playing performance in previous match that might serve to the manager as a signal about the suitability of the team formation. We expect that, independently of the final outcome in previous match,

[15] This means that our unit of analysis is team *i* in season *s* so that the same club in different seasons is treated as a different team. This is because, from one season to another, teams usually introduce important changes in their squad and staff.

if the team played well and created many opportunities to score, then there is a higher likelihood that the manager uses the same team formation.

Both the idiosyncratic error terms (ε_{it} and η_{it}) and the team effects (μ_i and ω_i) are allowed to be jointly normally distributed with covariance matrixes to be estimated. In this way, the recursive system in Equation (2) controls for both match-varying and match-invariant unobserved factors simultaneously affecting manager's choice and performance.

The coefficient estimates from Equation (2) are not directly interpretable except from their sign direction. To get the magnitude of the effect of confidence on the team performance, let us denote by $Perf_1$ the outcome under $Conf = 1$ and $Perf_0$ the outcome under $Conf = 0$. Once considering the endogeneity of the confidence decision based on both observed and unobserved factors, the Average Marginal Effect (AME) on each potential outcome is given by:

$$\begin{aligned} AME_{defeat} &= E(Perf_1 = 0|X_{it},\ Manager_{it}, Team_{it}, Z_{it}) \\ &\quad -E(Perf_0 = 0|X_{it}, Manager_{it}, Team_{it}, Z_{it}) \\ AME_{draw} &= E(Perf_1 = 1|X_{it}, Manager_{it}, Team_{it}, Z_{it}) \\ &\quad -E(Perf_0 = 1|X_{it}, Manager_{it}, Team_{it}, Z_{it}) \\ AME_{win} &= E(Perf_1 = 2|X_{it}, Manager_{it}, Team_{it}, Z_{it}) \\ &\quad -E(Perf_0 = 2|X_{it}, Manager_{it}, Team_{it}, Z_{it}) \end{aligned} \qquad (3)$$

where $E(Perf_k = j) = Prob(Perf_k = j|Conf = k)$ is the predicted probability of match outcome j, for $j = 0,1,2$ under confidence ($k = 1$) and under lack of it ($k = 0$). It is important to note that, in order to derive the magnitude of the AME, we take into account the fact that if $\rho_{\epsilon,\eta} = Corr(\varepsilon_{it}, \eta_{it}) \neq 0$, then $E(\varepsilon_{it}) \neq 0$, and therefore the performance fitted values incorporate the potential endogeneity of confidence through shared unobservables.

In what follows we then report our estimates from the panel ordered probit with endogeneity model of Equation (2). The model is estimated by maximum simulated likelihood using Gauss-Hermite quadrature with 7 integration points in Stata 16 using the *eoprobit* module. Standard errors are clustered at the team level to account for potential correlation arising among observations belonging to the same team over the different seasons. We adopt the convention to comment only on marginal effects significant at the 5% or lower level.

3.2. Main findings

Table 4 reports the coefficient estimates (Columns 1 and 2) and average marginal effects on each possible outcome (Columns 3, 4 and 5 for the performance equation, and Column 6 for the confidence equation) from the benchmark analysis. Starting with the role of managerial traits on performance, we find that the probability to win (lose) a match increases (decreases) if the manager is confident in the chosen team setting. Specifically, using the same team formation as in the previous match increases the winning probability by 40.8%. Therefore, we have evidence pointing to confidence into the same playing style exerting *a strongly positive impact* on the match outcome. Interestingly, also risk tolerance improves performance by shifting the winning probability by 2.1%. This implies that adopting an offensive formation relative to the neutral 4-4-2 setting (i.e. more than two strikers or less than four defenders) turns into a higher likelihood of winning the match. Instead, the negative effect of risk aversion on performance is not very significant.

Moving to match-specific factors, playing at home conveys a significant advantage to teams that translates into an almost 10% higher probability of winning, in line with previous evidence by Sutter and Kocher (2004), Dohmen (2008a) and Reilly and Witt (2013), among others.[16] Not surprisingly, also pre-match favoritism in terms of winning probabilities derived from betting odds has a positive and significant effect on the likelihood of winning the match (+7%). As we made clear in the previous section, this variable importantly contains full information on the expected quality balance between the two teams, including potential time-varying last-minute factors like sanctions or injuries by key players.

Matches that follow an unexpected win (unexpected defeat), everything else being equal, do not exhibit significantly different outcome likelihoods. Although the coefficient estimate for an unexpected win is negative and significant, the marginal effects are not. The reason for this discrepancy is that the standard error for the AME is computed using the delta method and it incorporates the covariance between the error terms (and the individual effects). Once the endogeneity of confidence is controlled for, there is no evidence that unexpected results

[16] Recent work exploring the home advantage issue during the Covid-19 period documents instead that, not surprisingly, with empty stadiums due to the Covid-19 restrictions forcing teams to play "ghost matches", teams do not benefit anymore from playing at home rather than away (see, e.g., Endrich and Gesche, 2020, on home bias in referee decisions).

translate into a different performance. Similarly, the goal difference in the previous match is not a significant predictor of the following match outcome based on the AME.

As for the effects of manager's characteristics, the team's winning probability increases with manager's experience in the league. Therefore, expertise and knowledge about the competition from the manager convey great advantage to teams. According to our estimates, there are no differences in team performance based on the manager's age, being foreign or being the first season he is in charge of the team. Similarly, there are no significant differences in match outcomes depending on whether the manager has been replaced within the season. This is in line with prior work (see e.g. Koning, 2003, and De Paola and Scoppa, 2012) showing that changing the manager does not produce a positive impact on team performance.[17]

Moving to the role of team composition characteristics, there are no differences in match outcomes depending on the average age, share of foreign players, share of new players in the squad or experience in the league of the starting eleven. However, we find that a marginal increase in the average wage of the lineup increases the winning probability by 8.5%. Therefore, assuming players are paid according to the value of their marginal product, quality is a major determinant of team performance. This is consistent with prior research in the sports economics literature (Hall et al., 2002).

Regarding the confidence equation, we document that the likelihood of opting for the same team formation increases after an unexpected win (+8%), whereas, in contrast, confidence is far less sensitive to unexpected defeats. In other words, managers' belief updating process turns out to be *asymmetrically biased*, in line with the "good news-bad news" effect identified by prior laboratory studies on non-managers (Eil and Rao, 2011; Coutts, 2019): while surprising good news (unexpected wins) significantly boost managerial confidence, surprising bad news (unexpected defeats) have a far lower impact on their tactical beliefs.[18] Since, as we made clear earlier in this subsection, our analysis indicates that managerial confidence positively and

[17] We argue that our finding further corroborates the well-known "scapegoat" interpretation of managers' replacements in elite soccer: when performances are disappointing, replacing the manager is easier than replacing a group of players, but this seems not to be an effective decision in many cases.

[18] The detected asymmetry is in line with the idea that individuals are affected by "self-attribution bias" in belief updating: far from similarly processing positive and negative new information, people tend to attribute positive outcomes to themselves and negative outcomes to external factors (e.g., lack of luck). For recent field evidence on the role of unexpected wins (but not of unexpected defeats) in high-stakes official football games in building a national identity, see Depetris-Chauvin et al. (2020).

strongly affects performance, we interestingly document that biased belief updating turns out to be ultimately *beneficial* in terms of team performance.

Confidence is also more likely the larger the goal difference (+3.1% per goal) and the higher the number of shots on target in the previous match (+0.6%). Therefore, the better the signal about the suitability of the team formation, the higher the manager's confidence in the same playing structure. By contrast, the probability of using the same setting decreases when there is a large shift in the pre-match winning probabilities (-1.5%): this suggests that managers adapt the team's system of play when they face really top or weak teams.

Interestingly, confidence is more prevalent among managers that are new in the team (8.4%). In principle, this evidence could indicate that confidence is driven by a conservative attitude such as "resistance to change". That is, managers that are new in the team may have limited knowledge of the team and this way they may cautiously decide to stick to the same setting with the players they know better. To investigate this possibility, we have re-estimated the model including the number of matches the manager has been in charge of the team, as a proxy for knowledge of the current team. In doing so, we explicitly take into account dismissals within the season. This variable is not statistically significant for explaining the confidence decision. We then conclude that knowledge of the current team does not play a relevant role and, because of this, we believe that it is not plausible to consider change aversion as an underlying driver of confidence. This regression is reported in Appendix Table A1. It is also relevant to note that we do not detect significant effects for home playing, pre-match favoritism and the remaining manager's characteristics in the confidence equation.

The error terms of the two equations are significantly negatively correlated (-0.78). This implies that i) confidence is endogenous, and ii) the unobserved factors that affect the confidence decision and the match outcome are negatively related. Similarly, the time-invariant random effects of the two equations are also significantly negatively related (-0.94). This indicates that there are some common unobserved team-specific match-invariant effects that need to be accounted for. The variances of the random effects are also significant in the two equations. This supports our empirical strategy as opposed to a pooled ordered probit.

TABLE 4 ABOUT HERE

To explore in greater detail the effect of confidence on team performance, we computed the average marginal effects of confidence evaluated for different sub-samples of the data. Sub-samples are taken conditional on match-, manager- and team-related variables. For continuous variables, we consider their median as a threshold. The specific figures are presented in Appendix Table A2. The size of the effects is around +40% for wins and -40% for losses, and negligible for draws. In general, we do not observe significant differences between groups. However, using the same definition of top and weak teams used in Sub-section 2.4, we document that the effect of confidence is greater in magnitude among "top teams" for increasing the winning probability (+43% vs. +38) but decreases the losing likelihood to a greater extent in weak teams (-44% vs. -39%).

To dig deeper into this issue, Tables 5 and 6 present the coefficient estimates and average marginal effects from separate regressions for "weak" and "top" teams, respectively.[19] The limitation of this analysis is that each regression uses half of the original sample size. However, we believe it is important because higher quality teams tend to pursue different and more ambitious goals, and managerial confidence might then play a differential role in the two team groups. Interestingly, we find that confidence does improve performance among top teams only, being instead not significant for weak ones. This implies that manager's perseverance in using the same system of play pays off for above-median wage teams but not for the weak teams. A plausible interpretation is that the lower quality of the weak team squads makes it difficult to reproduce their playing routines when they face more talented teams.[20] This might cause weak teams' managers to change the team formation to avoid big defeats. Indeed, the negative and significant effect of the difference in the winning probability relative to the previous match in

[19] We exclude from the specification the variable on the (log) wage of the team, because otherwise the model does not converge. It should be noted, however, that the analysis already implicitly controls for differences in team wage, since we run separate regressions for weak and top teams, which differ in wages. Our guess for the lack of convergence is that, since we split the sample based on team wage, we are reducing to a large extent the variability of the wage variable.

[20] On this regard, in top teams we notice higher wages for the eleven most frequent players of the season (the average is 1.728 as opposed to 0.454 million EUR. t-test: 11.79; p-value <0.001) as well as for the substitutes (the average is 1.202 as opposed to 0.353 million EUR. t-test: 12.37; p-value <0.001). This evidence reveals a general better quality of top teams, including first strings and bench. In contrast, we find no difference in the turnover rate. When teams play with the same setting as in the previous match, rarely they use exactly the same players (t-test: 1.20; p-value 0.23).

the confidence equation points in this direction. By contrast, this variable does not significantly affect confidence among top teams. This greater adaptation to the opponent among weak teams might additionally prevent the development of synergies and coordination among players when going back to the benchmark formation and playing against similar quality teams, thereby determining confidence not to make a significant difference in performance output.

We also document that risk tolerance improves performance for top teams only, and that manager's experience in the league is important for enhancing performance among both top and weak teams. As to the effects of risk tolerance on performance in top teams only, we recall from Sub-section 2.4 that managers in top teams are generally more risk tolerant and have more experience in the league. Moreover, only in top teams we observe significant differences in risk attitude when losing a match (see Table 3). However, risk attitude could play an indirect role on performance in weak teams. Indeed, only in weak teams we observe a strong negative effect of unexpected wins on performance. When this happens, we notice that risk tolerance falls (t-test: 2.116; p-value: 0.035). A possible explanation is that managers of weak teams get convinced that they can keep winning even with a less offensive setting. As a result, they start new matches with fewer strikers and/or more defenders. The probability to win could then fall because unexpected wins are associated to less risk tolerant settings.

TABLE 5 ABOUT HERE

TABLE 6 ABOUT HERE

3.3. Robustness checks

We performed several robustness checks to our analysis. The output is shown in Appendix Tables A3-A4. First, we use the number of points earned per match (*Points*) and the goal difference (*Goal diff.*) as dependent variables using a panel random effects model with endogeneity (namely, a joint estimation of a panel regression for performance and a probit for confidence). Columns (1)-(4) in Appendix Table A3 report the estimates, which provide consistent results. Second, our model controls for team effects through team random effects in addition to team characteristics. Alternatively, we adopted a pooled ordered probit specification with endogeneity that does not consider unobserved heterogeneity. The estimates are shown in Columns (1)-(2) of Appendix Table A4. Results are about the same as in the main analysis. As a final check, we re-estimated the model considering team fixed effects rather than random

effects. To reduce the incidental parameter problem of estimating many coefficients, and in contrast to our previous analyses, we assume that the team remains the same across the years.[21] The results, shown in Columns (3)-(4), are consistent with our main analysis.

4. Conclusions

Through our analysis based on professional elite soccer data, we sought to contribute to the burgeoning line of inquiry investigating the explanatory role of managerial characteristics in accounting for the observed variability in firms' behavior and performance. Compared to prior fieldwork, the richness of our high-frequency field data made it possible to draw a tighter link between CEO characteristics and corporate outcomes within a dynamic tournament setting with ample learning opportunities for managers. We also speak to the vast research area in economics and social psychology relying on laboratory experiments to explore the nature of individual belief updating processes in the face of frequent performance feedback.

Our core findings corroborate and help qualify the "managers matter" view advanced in prior literature, i.e. the broad idea that not only firm-level variables, but also unobservable personal characteristics of managers contribute to our understanding of corporate decision-making. In particular, we believe that on the whole our findings naturally connect to a series of prior studies shedding light on the "bright side" of managerial biases (see, e.g., Campbell et al., 2011; Hirshleifer et al., 2012; Chen and Schildberg-Hörisch, 2019). Next, based on the distinction between top and weak teams, our results point to the role of key features of the firms in mediating the effects of managerial characteristics on firm performance (see, e.g., Graham et al., 2015; Malmendier and Tate, 2005a; Bandiera et al., 2020, for prior fieldwork on other industries showing that some CEO traits or behaviors that turn out to be correlated with firm performance are more common in some types of organizations – e.g., larger firms – than in others).

We see three main limitations of this study, that also envisage avenues for future research. First, our data do not allow us to control for other potentially relevant dimensions, on top of managerial traits, such as ownership, other managers' (e.g., CFOs) role, and even factors related to "corporate culture", that may play a role, possibly also with regard to the identification of

[21] That is, for instance, we include in the specification a dummy variable for "Juventus" rather than one for "Juventus 2009", one for "Juventus 2010", and so on.

the exact mechanisms that underlie our core findings. Second, even though prior work indicates that managers' personality traits are relevant to their decisions at the helm of a firm (see, e.g., Graham et al., 2013), our dataset does not allow us to dig deeper into the role of unobservable non-cognitive factors in affecting their team outcomes (see, e.g., Adams et al., 2018). In particular, it would be interesting to see whether relevant leaders' traits identified in prior work such as, e.g., "resoluteness" – that makes him credible among his followers (Bolton et al., 2013) – interplay with our measure of managerial confidence in influencing corporate performance. Third, since all managers in Italian "Serie A" are male, our study does not contribute to the understanding of the effects of the gender dimension in managerial behavior and, in turn, with regard to corporate policies (Graham et al., 2013) and firm performance (Faccio et al., 2016). We leave these important research questions as promising avenues for future research on the impact of managerial traits on corporate performance.

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Table 1. Initial team setting (*N*=3,160)

N. Strikers → N. Defenders ↓	0	1	2	3	4
1	0 (0%)	0 (0%)	0 (0%)	1 (0.03%)	0 (0%)
2	1 (0.03%)	6 (0.19%)	16 (0.51%)	17 (0.54%)	0 (0%)
3	4 (0.13%)	73 (2.31%)	348 (11.01%)	122 (3.86%)	7 (0.22%)
4	30 (0.95%)	340 (10.76%)	1,065 (33.70%)	465 (14.72%)	21 (0.66%)
5	21 (0.66%)	163 (5.16%)	326 (10.32%)	66 (2.09%)	5 (0.16%)
6	1 (0.03%)	23 (0.73%)	29 (0.92%)	7 (0.22%)	0 (0%)
7	0 (0%)	1 (0.03%)	1 (0.03%)	1 (0.03%)	0 (0%)

Table 2. Summary statistics

	Observations	Mean	Std. dev.	Min	Max
Dependent variables					
Performance	3,160	1.000	0.859	0	2
Win	3,160	0.369	0.483	0	1
Draw	3,160	0.261	0.439	0	1
Defeat	3,160	0.370	0.483	0	1
Points	3,160	1.367	1.308	0	3
Goal difference	3,160	0.000	1.698	-7	7
Manager's traits					
Confidence	2,904	0.532	0.499	0	1
Risk tolerance	3,160	0.341	0.474	0	1
Risk aversion	3,160	0.321	0.467	0	1
Match characteristics					
Home	3,160	0.500	0.500	0	1
Win probability	3,160	0.390	0.190	0.029	0.943
Unexpected win	2,956	0.088	0.284	0	1
Unexpected defeat	2,956	0.094	0.292	0	1
Manager's characteristics					
Age	3,160	49.686	7.330	36	70
Years in A	3,160	4.539	4.035	0	16
Foreign	3,160	0.131	0.337	0	1
New in team	3,160	0.452	0.498	0	1
Dismissed	3,160	0.112	0.315	0	1
Team characteristics					
New in A	3,160	0.150	0.357	0	1
Avg. age	3,160	27.309	1.482	23.182	32.636
Avg. years in A	3,160	4.458	1.532	0.909	10.273
Share foreign	3,160	0.503	0.224	0	1
Share new in team	3,160	0.358	0.178	0	1
Log wage	3,160	6.634	0.754	4.998	8.858

Table 3. Preliminary analysis

a) Whole sample

Sample Statistic	All Average	Winners Average	Non-winners Average	t-test	Losers Average	Non-losers Average	t-test
Confidence	0.532	0.535	0.529	-0.311	0.511	0.544	1.720*
Observations	*2,904*	*1,072*	*1,832*		*1,067*	*1,837*	
Risk tolerance	0.341	0.352	0.334	-1.036	0.322	0.351	1.663*
Observations	*3,160*	*1,165*	*1,995*		*1,170*	*1,990*	
Risk aversion	0.321	0.307	0.329	1.251	0.360	0.298	-3.596***
Observations	*3,160*	*1,165*	*1,995*		*1,170*	*1,990*	

b) Weak teams

Sample Statistic	All Average	Winners Average	Non-winners Average	t-test	Losers Average	Non-losers Average	t-test
Confidence	0.520	0.540	0.513	-0.920	0.482	0.554	2.748***
Observations	*1,458*	*389*	*1,069*		*687*	*771*	
Risk tolerance	0.308	0.303	0.310	0.252	0.308	0.309	0.032
Observations	*1,590*	*422*	*1,168*		*757*	*833*	
Risk aversion	0.352	0.358	0.350	-0.282	0.374	0.333	-1.722*
Observations	*1,590*	*422*	*1,168*		*757*	*833*	

c) Top teams

Sample Statistic	All Average	Winners Average	Non-winners Average	t-test	Losers Average	Non-losers Average	t-test
Confidence	0.544	0.533	0.553	0.768	0.563	0.537	-0.893
Observations	*1,446*	*683*	*763*		*380*	*1,066*	
Risk tolerance	0.373	0.380	0.368	-0.489	0.349	0.382	1.203
Observations	*1,570*	*743*	*827*		*413*	*1,157*	
Risk aversion	0.289	0.279	0.299	0.876	0.334	0.273	-2.348**
Observations	*1,570*	*743*	*827*		*413*	*1,157*	

*Note. Weak (top) teams are teams with average wage in the season below (above) the season-specific median wage. The last column reports the value of a t-test on the equality of the proportions in the two sub-samples of "Win" and "Draw or Loss" and "Lose" and "Draw or Win", respectively. *** p<0.01, ** p<0.05, * p<0.1.*

Table 4. Performance probabilities (benchmark case)

Outcome	(1) Coefficient Performance	(2) Coefficient Confidence	(3) AME Defeat	(4) AME Draw	(5) AME Win	(6) AME Confidence
Confidence	1.281***		-0.418***	0.009	0.408***	
	(0.209)		(0.069)	(0.012)	(0.070)	
Risk tolerance	0.054**		-0.021**	-5.7-05	0.021**	
	(0.027)		(0.010)		(0.010)	
Risk aversion	-0.076*		0.030*	-5.7e-04	-0.030*	
	(0.046)		(0.018)	(0.001)	(0.018)	
Home	0.227***	0.030	-0.098***	5.0e-04	0.098***	0.010
	(0.057)	(0.042)	(0.020)	(0.004)	(0.020)	(0.014)
Win probability	1.669***	0.076	-0.066***	-0.003	0.070***	0.002
	(0.241)	(0.115)	(0.009)	(0.002)	(0.008)	(0.004)
Unexpected win	-0.170**	0.231***	0.027	-0.001	-0.025	0.079***
	(0.081)	(0.088)	(0.029)	(0.001)	(0.028)	(0.029)
Unexpected defeat	-0.029	-0.133*	0.036	-0.001	-0.035*	-0.045*
	(0.074)	(0.079)	(0.023)	(0.002)	(0.021)	(0.027)
Lag goal diff.	-0.044**	0.091***	-0.001	2.2e-04	9.6e-04	0.031***
	(0.018)	(0.018)	(0.007)	(1.0e-04)	(0.007)	(0.006)
Manager: Age	-0.010**	0.011*	2.1e-04*	-4.3e-06	-2.0e-4*	0.004*
	(0.004)	(0.007)	(1.1e-04)	(1.0e-05)	(1.1e-04)	(0.002)
Manager: Years in A	0.032***	-0.016	-0.010***	2.8e-05	0.010***	-0.005
	(0.010)	(0.014)	(0.002)	(4.9e-04)	(0.002)	(0.005)
Manager: Foreign	-0.008	-0.120	-0.025	3.7e-04	-0.024	-0.041
	(0.088)	(0.143)	(0.019)	(0.001)	(0.018)	(0.049)
Manager: New in team	-0.073	0.243**	-0.014	-4.5e-04	0.014	0.084**
	(0.070)	(0.099)	(0.016)	(8.1e-04)	(0.016)	(0.034)
Manager: Dismissed	0.121	-0.011	-0.046*	-0.001	0.047*	-0.003
	(0.100)	(0.146)	(0.024)	(0.002)	(0.025)	(0.050)
Team: Avg. age	0.032		-0.012	-3.7e-05	0.012	
	(0.020)		(0.008)	(6.2e-04)	(0.008)	
Team: Share foreign	-0.069		0.002	3.0e-05	-0.002	
	(0.096)		(0.003)	(1.3e-04)	(0.003)	
Team: Share new	-0.240*		0.009*	-1.6e-04	-0.009*	
	(0.143)		(0.005)	(4.9e-04)	(0.005)	
Team: Avg. years in A	-0.039*		0.016*	-3.5e-04	-0.015*	
	(0.021)		(0.008)	(8.2e-04)	0.008	
Team: New in A	0.033		-0.013	7.9e-07	0.013	
	(0.063)		(0.025)	(6.5e-04)	(0.025)	
Team: Log wage	0.208***		-0.080***	-0.005	0.085***	
	(0.049)		(0.016)	(0.005)	(0.020)	
Diff. win prob.		-0.438**				-0.015***
		(0.177)				(0.006)
Lag shots on target		0.018**				0.006***
		(0.007)				(0.002)
Constant		-0.534*				
		(0.319)				
σ_μ	0.052***					
	(0.020)					
σ_ω		0.260***				
		(0.048)				
Corr $(\varepsilon_{it}, \eta_{it})$		-0.788***				
		(0.144)				
Corr (μ_i, ω_i)		-0.945***				
		(0.078)				
Number of teams		200				
Observations		2,900				

*Note. The table reports results from a panel ordered probit regression with endogeneity. Standard errors are clustered at the team level. *** p<0.01, ** p<0.05, * p<0.1.*

Table 5. Separate regressions for weak teams

Outcome	(1) Coefficient Performance	(2) Coefficient Confidence	(3) AME Defeat	(4) AME Draw	(5) AME Win	(6) AME Confidence
Confidence	0.601		-0.208	0.036	0.172	
	(0.820)		(0.283)	(0.043)	(0.240)	
Risk tolerance	0.074		-0.026	0.004	0.022	
	(0.066)		(0.023)	(0.004)	(0.019)	
Risk aversion	-0.035		0.012	-0.002	-0.010	
	(0.074)		(0.026)	(0.005)	(0.021)	
Home	0.255***	0.082	-0.098***	0.017*	0.081***	0.027
	(0.090)	(0.070)	(0.032)	(0.010)	(0.023)	(0.023)
Win probability	2.859***	0.289	-0.101***	0.009*	0.091***	0.009
	(0.399)	(0.218)	(0.012)	(0.005)	(0.010)	(0.007)
Unexpected win	-0.249***	0.166	0.078**	-0.017*	-0.061**	0.056
	(0.096)	(0.115)	(0.033)	(0.009)	(0.025)	(0.038)
Unexpected defeat	-0.046	-0.156	0.025	-0.004	-0.020	-0.053
	(0.137)	(0.143)	(0.045)	(0.010)	(0.035)	(0.049)
Lag goal diff.	0.001	0.145***	-0.009	0.001	0.007	0.049***
	(0.044)	(0.024)	(0.015)	(0.003)	(0.012)	(0.007)
Manager: Age	-0.008	0.019*	0.001	-3.1e-04	-0.001	0.006**
	(0.007)	(0.010)	(0.002)	(3.8e-04)	(0.002)	(0.003)
Manager: Years in A	0.033***	-0.032*	-0.009***	0.001	0.008***	-0.010*
	(0.011)	(0.019)	(0.003)	(6.5e-04)	(0.003)	(0.006)
Manager: Foreign	-0.115	0.081	0.036	-0.007	-0.029	-0.027
	(0.076)	(0.216)	(0.027)	(0.006)	(0.021)	(0.073)
Manager: New in team	0.105	0.272**	-0.053	-0.009	0.044	0.093**
	(0.105)	(0.129)	(0.035)	(0.008)	(0.027)	(0.043)
Manager: Dismissed	0.175	-0.111	-0.055	0.008	0.047	-0.037
	(0.114)	(0.182)	(0.035)	(0.004)	(0.032)	(0.062)
Team: Avg. age	0.047		-0.016	0.002	0.013	
	(0.042)		(0.014)	(0.002)	(0.012)	
Team: Share foreign	0.248		-0.008	0.001	0.007	
	(0.175)		(0.006)	(0.001)	(0.005)	
Team: Share new	-0.378		0.013	-0.002	-0.011	
	(0.237)		(0.084)	(0.002)	(0.006)	
Team: Avg. years in A	-0.026		0.009	-0.001	-0.007	
	(0.037)		(0.013)	(0.002)	(0.010)	
Team: New in A	0.120		-0.042	0.006	0.035	
	(0.100)		(0.034)	(0.005)	(0.030)	
Diff. win prob.		-1.268***				-0.043***
		(0.281)				(0.009)
Lag shots on target		0.013				0.004
		(0.024)				(0.008)
Constant		-0.762*				
		(0.463)				
σ_μ	0.006					
	(0.021)					
σ_ω		0.232***				
		(0.069)				
Corr $(\varepsilon_{it}, \eta_{it})$		-0.321				
		(0.499)				
Corr (μ_i, ω_i)		-0.335				
		(1.881)				
Number of teams		117				
Observations		1,457				

*Note. The table reports results from a panel ordered probit regression with endogeneity. Standard errors are clustered at the team level. *** p<0.01, ** p<0.05, * p<0.1.*

Table 6. Separate regressions for top teams

Outcome	(1) Coefficient Performance	(2) Coefficient Confidence	(3) AME Defeat	(4) AME Draw	(5) AME Win	(6) AME Confidence
Confidence	1.381***		-0.430***	-0.028*	0.459***	
	(0.177)		(0.063)	(0.014)	(0.056)	
Risk tolerance	0.065***		-0.025***	-0.005	0.031***	
	(0.025)		(0.008)	(0.003)	(0.011)	
Risk aversion	-0.122*		0.049*	0.009	-0.058*	
	(0.070)		(0.026)	(0.007)	(0.033)	
Home	0.210***	-0.009	-0.081***	-0.018*	0.100***	-0.003
	(0.072)	(0.064)	(0.023)	(0.011)	(0.031)	(0.022)
Win probability	1.432***	0.030	-0.054***	-0.015***	0.069***	0.001
	(0.208)	(0.160)	(0.006)	(0.006)	(0.008)	(0.005)
Unexpected win	-0.173	0.203*	0.027	0.003	-0.031	0.069*
	(0.126)	(0.107)	(0.040)	(0.007)	(0.047)	(0.036)
Unexpected defeat	0.005	-0.084	0.015	0.003	-0.018	-0.029
	(0.070)	(0.079)	(0.030)	(0.006)	(0.036)	(0.027)
Lag goal diff.	-0.043*	0.063**	0.004	4-6e-04	-0.004	0.021**
	(0.024)	(0.030)	(0.007)	(0.001)	(0.008)	(0.010)
Manager: Age	-0.009	0.001	0.003*	-6.4e-04	-0.003*	4.7e-04
	(0.007)	(0.009)	(0.001)	(5.4e-01)	(0.002)	(0.003)
Manager: Years in A	0.026	0.005	-0.011***	-0.002	0.013***	0.001
	(0.019)	(0.023)	(0.003)	(0.001)	(0.005)	(0.008)
Manager: Foreign	0.054	-0.120	-0.003	0.001	-0.004	-0.041
	(0.135)	(0.188)	(0.025)	(0.005)	(0.031)	(0.065)
Manager: New in team	-0.155	0.222*	0.015	0.002	-0.017	0.076*
	(0.109)	(0.127)	(0.024)	(0.004)	(0.029)	(0.043)
Manager: Dismissed	0.031	0.125	-0.036	-0.010	0.047	0.043
	(0.127)	(0.182)	(0.037)	(0.010)	(0.047)	(0.062)
Team: Avg. age	0.026		-0.010	-0.002	0.012	
	(0.023)		(0.008)	(0.002)	(0.010)	
Team: Share foreign	0.025		-9.7e-04	-2.0e-04	0.001	
	(0.115)		(0.004)	(9.8e-04)	(0.00)	
Team: Share new	-0.186		0.007	0.001	-0.008	
	(0.161)		(0.006)	(0.001)	(0.007)	
Team: Avg. years in A	-0.019		0.007	0.001	-0.009	
	(0.028)		(0.011)	(0.002)	(0.013)	
Team: New in A	-0.191		0.080	0.010	-0.090	
	(0.184)		(0.078)	(0.008)	(0.084)	
Diff. win prob.		-0.193				-0.006
		(0.220)				(0.007)
Lag shots on target		0.023***				0.007***
		(0.008)				(0.003)
Constant		-0.178				
		(0.410)				
σ_μ	0.116***					
	(0.021)					
σ_ω		0.271***				
		(0.065)				
Corr $(\varepsilon_{it}, \eta_{it})$		-0.885***				
		(0.115)				
Corr (μ_i, ω_i)		-0.902***				
		(0.060)				
Number of teams		118				
Observations		1,443				

*Note. The table reports results from a panel ordered probit regression with endogeneity. Standard errors are clustered at the team level. *** p<0.01, ** p<0.05, * p<0.1*

Table A1. Regression results including the number of matches in charge (coefficients)

	(1)	(2)
Outcome	Performance	Confidence
Confidence	1.284***	
	(0.210)	
Risk tolerance	0.054**	
	(0.027)	
Risk aversion	-0.074	
	(0.047)	
Home	0.226***	0.030
	(0.057)	(0.042)
Win probability	1.675***	0.073
	(0.240)	(0.117)
Unexpected win	-0.175**	0.234***
	(0.083)	(0.089)
Unexpected defeat	-0.028	-0.133*
	(0.073)	(0.079)
Lag goal diff.	-0.044**	0.091***
	(0.019)	(0.018)
Manager: Age	-0.010**	0.011*
	(0.004)	(0.007)
Manager: Years in A	0.033***	-0.016
	(0.010)	(0.014)
Manager: Foreign	-0.007	-0.122
	(0.088)	(0.143)
Manager: New in team	-0.075	0.244**
	(0.070)	(0.099)
Manager: Dismissed	0.110	-0.004
	(0.101)	(0.148)
Team: Avg. age	0.032	
	(0.020)	
Team: Share foreign	-0.070	
	(0.097)	
Team: Share new	-0.238*	
	(0.144)	
Team: Avg. years in A	-0.040*	
	(0.022)	
Team: New in A	0.034	
	(0.063)	
Team: Log wage	0.209***	
	(0.050)	
Diff. win prob.		-0.439**
		(0.178)
Lag shots on target		0.018**
		(0.007)
Number of matches	-0.006	0.005
	(0.005)	(0.007)
Constant		-0.574*
		(0.332)
σ_μ	0.053***	
	(0.020)	
σ_ω		0.260***
		(0.047)
Corr $(\varepsilon_{it}, \eta_{it})$	-0.938***	
	(0.080)	
Corr (μ_i, ω_i)	-0.623***	
	(0.116)	
Number of teams	200	
Observations	2,900	

*Note. The table reports results from a panel ordered probit regression with endogeneity. Standard errors are clustered at the team level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A2. AMEs of confidence on performance in different sub-samples

Sub-sample	Observations	Defeat	Draw	Win
FULL	2,900	-0.418***	0.009	0.408***
Risk tolerance=1	981	-0.413***	-0.001	0.415***
Risk aversion=1	931	-0.423***	0.022*	0.400***
Home=1	1,453	-0.395***	-0.034***	0.430***
Win probability >0.346	1,473	-0.384***	-0.058***	0.442***
Unexpected win=1	268	-0.434***	0.047***	0.387***
Unexpected defeat=1	259	-0.404***	-4.0e-05	0.405***
Lag goal diff >0	1,097	-0.416***	0.011	0.404***
Manager: Age >49	1,438	-0.420***	0.010	0.410***
Manager: Years in A >4	1,258	-0.410***	-0.010	0.420***
Manager: Foreign=1	380	-0.404***	-0.019	0.423***
Manager: New in team=1	1,295	-0.425***	0.022*	0.403***
Manager: Dismissed=1	299	-0.431***	0.030*	0.400***
Team: Avg. age >27.27	1,509	-0.412***	-6.8e-04	0.414***
Team: Share foreign >0.545	1,474	-0.405***	-0.010***	0.416***
Team: Share new >363	1,608	-0.427***	0.027**	0.399***
Team: Avg. years in A >4.27	1,501	-0.411***	-0.004	0.416***
Team: New in A=1	435	-0.444***	0.069***	0.374***
Weak teams	1,457	-0.443***	0.055***	0.388***
Top teams	1,443	-0.393***	-0.036*	0.429***

*Note. The table reports average marginal effects for confidence from a panel ordered probit regression with endogeneity. Standard errors are clustered at the team level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A3. Robustness checks: Performance measure (coefficients)

Outcome	(1) Performance: Points	(2) Confidence	(3) Performance: Goal diff.	(4) Confidence
Confidence	0.757**		1.565***	
	(0.382)		(0.330)	
Risk tolerance	0.062*		0.090**	
	(0.034)		(0.046)	
Risk aversion	-0.081		-0.095	
	(0.058)		(0.065)	
Home	0.289***	0.028	0.319***	0.027
	(0.051)	(0.042)	(0.073)	(0.042)
Win probability	2.070***	0.074	3.020***	0.070
	(0.191)	(0.112)	(0.235)	(0.119)
Unexpected win	-0.113	0.232***	-0.234*	0.225***
	(0.093)	(0.085)	(0.130)	(0.084)
Unexpected defeat	-0.074	-0.139*	0.016	-0.136*
	(0.064)	(0.081)	(0.109)	(0.076)
Lag goal diff.	-0.022	0.094***	-0.054*	0.092***
	(0.022)	(0.018)	(0.029)	(0.018)
Manager: Age	-0.009**	0.011*	-0.009	0.011
	(0.004)	(0.007)	(0.006)	(0.007)
Manager: Years in A	0.035***	-0.015	0.037**	-0.014
	(0.010)	(0.014)	(0.015)	(0.015)
Manager: Foreign	-0.054	-0.113	-0.063	-0.107
	(0.073)	(0.145)	(0.114)	(0.143)
Manager: New in team	-0.029	0.252**	-0.099	0.253**
	(0.069)	(0.105)	(0.099)	(0.101)
Manager: Dismissed	0.164*	-0.017	0.151	-0.034
	(0.093)	(0.146)	(0.147)	(0.142)
Team: Avg. age	0.035		0.003	
	(0.025)		(0.032)	
Team: Share foreign	0.000		0.011	
	(0.110)		(0.169)	
Team: Share new	-0.253		-0.222	
	(0.168)		(0.206)	
Team: Avg. years in A	-0.045		-0.046	
	(0.028)		(0.034)	
Team: New in A	0.059		-0.066	
	(0.079)		(0.098)	
Team: Log wage	0.262***		0.338***	
	(0.062)		(0.077)	
Diff. win prob.		-0.479***		-0.438**
		(0.181)		(0.178)
Lag shots on target		0.014		0.015**
		(0.009)		(0.007)
Constant	-2.030**	-0.511	-3.800***	-0.510
	(0.878)	(0.330)	(1.013)	(0.333)
σ_μ	0.024		0.091*	
	(0.018)		(0.047)	
σ_ω		0.274***		0.266***
		(0.050)		(0.047)
Corr $(\varepsilon_{it}, \eta_{it})$		-0.376**		-0.573***
		(0.171)		(0.105)
Corr (μ_i, ω_i)		-0.680***		-0.877***
		(0.239)		(0.113)
Number of teams		200		200
Observations		2,900		2,900

*Note. The table reports results from a panel random effects regression with Endogeneity. Standard errors are clustered at the team level. *** p<0.01, ** p<0.05, * p<0.1.*

Table A4. Robustness checks: Team effects (coefficients)

	(1)	(2)	(3)	(4)
Outcome	Performance	Confidence	Performance	Confidence
Confidence	1.280***		1.136***	
	(0.139)		(0.226)	
Risk tolerance	0.047*		0.061**	
	(0.024)		(0.030)	
Risk aversion	-0.076*		-0.083	
	(0.044)		(0.052)	
Home	0.220***	0.023	0.251***	0.016
	(0.048)	(0.039)	(0.051)	(0.041)
Win probability	1.573***	0.037	1.640***	0.201
	(0.228)	(0.166)	(0.278)	(0.195)
Unexpected win	-0.189**	0.251***	-0.153*	0.231***
	(0.086)	(0.097)	(0.091)	(0.088)
Unexpected defeat	-0.030	-0.119	-0.042	-0.115
	(0.072)	(0.079)	(0.073)	(0.088)
Lag goal diff.	-0.040***	0.078***	-0.042**	0.087***
	(0.015)	(0.017)	(0.018)	(0.018)
Manager: Age	-0.008**	0.007	-0.011**	0.005
	(0.004)	(0.006)	(0.005)	(0.008)
Manager: Years in A	0.029***	-0.010	0.030***	-0.005
	(0.009)	(0.012)	(0.011)	(0.017)
Manager: Foreign	-0.029	-0.064	-0.033	-0.069
	(0.103)	(0.157)	(0.101)	(0.143)
Manager: New in team	-0.064	0.191**	-0.033	0.224***
	(0.069)	(0.082)	(0.101)	(0.085)
Manager: Dismissed	0.128	-0.054	0.175*	-0.036
	(0.094)	(0.116)	(0.100)	(0.140)
Team: Avg. age	0.028		0.034	
	(0.018)		(0.021)	
Team: Share foreign	-0.071		-0.010	
	(0.083)		(0.130)	
Team: Share new	-0.244*		-0.106	
	(0.129)		(0.174)	
Team: Avg. years in A	-0.038*		-0.037*	
	(0.020)		(0.022)	
Team: New in A	0.026		0.160**	
	(0.058)		(0.079)	
Team: Log wage	0.203***		0.315***	
	(0.050)		(0.100)	
Diff. win prob.		-0.407**		-0.572***
		(0.172)		(0.180)
Lag shots on target		0.012*		0.012
		(0.007)		(0.007)
Constant		-0.324		0.081
		(0.258)		(0.387)
Corr $(\varepsilon_{it}, \eta_{it})$	-0.803***		-0.701***	
	(0.098)		(0.145)	
Team Fixed Effects	NO		YES	
Number of teams	200		200	
Observations	2,900		2,900	

*Note. The table reports results from a pooled ordered probit regression with endogeneity in Columns (1)-(2) and a panel ordered probit regression with endogeneity and fixed effects in Columns (3)-(4). *** p<0.01, ** p<0.05, * p<0.1.*